

REMARKS

Claims 1-4 remain herein.

1. Claims 1-4 were rejected for alleged obviousness-type double patenting over claims 1-3 of Okuzawa et al. U.S. Patent 6,115,479.

Applicants' claim 1 recites a loudspeaker copper foil wire comprising a copper foil wire body impregnated or coated with a flame resistant wax, the flame resistant wax comprising a petroleum paraffin wax and 5 wt% to 50 wt% of a halogen-free aromatic condensation phosphoric ester flame retardant powder or particulate.

Okuzawa claims 1-3 do not disclose applicant's claimed copper foil wire. As admitted in the Office Action, Okuzawa does not claim the use of a flame resistant wax comprising 5 wt% to 50 wt% of a halogen-free aromatic condensation phosphoric ester flame retardant powder or particulate. Instead, Okuzawa claims 50 wt% to 150 wt% of a liquid phosphoric ester flame retardant. The Office Action states that it would have been obvious to one of ordinary skill in the art to use a halogen-free flame retardant. However, there is a wide range of halogen-free flame retardants including phosphorus flame retardants, triazine compounds, and other organic and inorganic flame retardants (see Asano U.S. Application Publication 2001/0007888 at ¶ [0046]). In addition, even among organic phosphorus flame retardants, there is a great variety of compounds, including: phosphoric esters (which can be aliphatic phosphoric esters or aromatic phosphoric esters), phosphonic acids and salts thereof, phosphinic acids and salts thereof, phosphine, phosphine oxide, biphosphine, phosphonium salts, phosphagene, phosphaphenanthrene compounds, etc. (see Asano '888 at ¶ [0047]). Thus, it would not have

been obvious to one of ordinary skill in this art that the use of applicant's specific halogen-free aromatic condensation phosphoric ester flame retardant, either powder or particulate, would achieve superior flexural strength and hopping resistance, equivalent corrosion resistance and soldering property, and equivalent or better flame resistance, even when used in significantly lesser amounts. See Tables 1 and 2 at pages 6 and 9 of applicant's specification (comparing applicant's claimed copper foil wires A, B, and C, which are impregnated with a wax including, respectively, 5, 10, or 15 parts of the claimed flame retardant, to the prior art copper foil wire which is impregnated with a wax including 100 parts of the prior art flame retardant). Nothing in Okuzawa suggests the use of 5 wt% to 50 wt% of a halogen-free aromatic condensation phosphoric ester flame retardant. In fact, Okuzawa teaches away from such use and states:

When the phosphoric ester flame retardant is less than 50%, 40% for example, the flame resistance becomes insufficient, and when the phosphoric ester flame retardant is more than 150%, the mixing condition with the petroleum wax becomes worse. This causes nonuniform product quality and therefore is not preferable for the copper foil flexible wire.

Okuzawa at column 2, lines 28-34 (emphasis added here).

The amount of flame retardant in the wax is not obvious. Applicant's specification explains:

The wax for the prior art loudspeaker copper foil wires contains a halogen-containing liquid phosphoric ester such as a bromine-containing triaryl phosphoric ester as the flame retardant and, optionally, an inorganic flame retardant and an organic tin compound as a stabilizer and, therefore, has a poorer flame resistance. In order to ensure a flame resistance equivalent to the UL Standard 94V-1, the flame retardant should be blended in a weight ratio of not smaller than 100% in the wax. Therefore, the effect of the wax is reduced, so that the copper foil wires suffer from deterioration of moisture resistance and corrosion resistance, generation of noises and breakage due to the hopping phenomenon, emanation of smell during a soldering operation, and deterioration of soldering property.

Applicant's specification at page 2, line 35 to page 3, line 14 (emphasis added here).

Thus, Okuzawa does not claim all elements of applicant's claimed invention, and further claims nothing that would have suggested applicant's claimed invention and especially its attendant advantages, to one of ordinary skill in the art. Applicant respectfully requests reconsideration and withdrawal of this rejection.

2. Claims 1-4 were rejected under 35 U.S.C. § 103(a) over Okuzawa et al. U.S. Patent 6,115,479 in view of Applicant's Admitted Prior Art and Asano U.S. Application Publication 2001/0007888.

Claim 1 recites a loudspeaker copper foil wire comprising a copper foil wire body impregnated or coated with a flame resistant wax, the flame resistant wax comprising a petroleum paraffin wax and 5 wt% to 50 wt% of a halogen-free aromatic condensation phosphoric ester flame retardant powder or particulate.

As discussed above and as admitted in the Office Action, Okuzawa does not teach or suggest applicant's claimed copper foil wire. Okuzawa does not teach or suggest the use of a flame resistant wax comprising 5 wt% to 50 wt% of a halogen-free aromatic condensation phosphoric ester flame retardant powder or particulate.

Neither Applicant's Admitted Prior Art nor Asano teaches or suggests what is missing from Okuzawa. Applicant's Admitted Prior Art states that Daihachi's phosphoric ester flame retardant (PX-200) is available on the marketplace. However, a wide variety of other flame retardant products are also available and a person of ordinary skill in the art would not have known that the use of applicant's specific phosphoric ester flame retardant would have allowed a

significant reduction of flame retardant amount in the flame resistant wax and would have achieved superior flexural strength and hopping resistance, equivalent corrosion resistance and soldering property, and equivalent or better flame resistance, even when used in significantly lesser amounts (see Tables 1 and 2 at pages 6 and 9 of applicant's specification (comparing applicant's claimed copper foil wires A, B, and C, which are impregnated with a wax including, respectively, 5, 10, or 15 parts of the claimed flame retardant, to the prior art copper foil wire which is impregnated with a wax including 100 parts of the prior art flame retardant)).

Nor does Asano teach or suggest what is missing from Okuzawa. Asano discloses a long catalogue of potential non-halogen organic flame retardants (Asano at ¶¶ [0046]-[0049]) but does not teach or suggest that using applicant's halogen-free aromatic condensation phosphoric ester flame retardant, powder or particulate, will permit a significant reduction in the amount of flame retardant used, while obtaining equivalent or better flame resistance. In addition, Asano says nothing about the appropriate amount of non-halogen flame retardant in a flame resistant wax for coating copper foil wires. Instead, Asano discusses flame retardants in the context of resin compositions for molded articles. The amount of flame retardant in a resin for extrusion molding is not relevant to the appropriate amount of applicant's claimed halogen-free aromatic condensation phosphoric ester flame retardant, powder or particulate, for use in a flame resistant wax for coating copper foil wires.

Evidence that the claimed invention yields unexpectedly improved properties or properties not present in the prior art rebuts an obviousness rejection. MPEP § 2145. While Asano suggests the environmental benefits of non-halogen flame retardants in general, Asano says nothing about using applicant's specific halogen-free aromatic condensation phosphoric

ester flame retardant, powder or particulate, to significantly reduce the amount of flame retardant required in a flame resistant wax. Applicant's (1) claimed halogen-free aromatic condensation phosphoric ester flame retardant, powder or particulate, and (2) its 5 wt% to 50 wt% level in the flame resistant wax, are not obvious but achieve superior flexural strength and hopping resistance, equivalent corrosion resistance and soldering property, and equivalent or better flame resistance (see Tables 1 and 2 at pages 6 and 9 of applicant's specification (comparing applicant's claimed copper foil wires A, B, and C, which are impregnated with a wax including, respectively, 5, 10, or 15 parts of the claimed flame retardant, to the prior art copper foil wire which is impregnated with a wax including 100 parts of the prior art flame retardant)).

Thus, none of Okuzawa, Applicant's Admitted Prior Art, and Asano discloses all elements of applicant's claimed invention. In addition, Okuzawa, Applicant's Admitted Prior Art, and Asano disclose nothing that would have suggested applicant's claimed invention, and especially its attendant advantages, to one of ordinary skill in this art. Furthermore, there is no disclosure or teaching in Okuzawa, Applicant's Admitted Prior Art, Asano, or otherwise in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicant's claimed invention. Applicant respectfully requests reconsideration and withdrawal of this rejection.

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Accordingly, all claims 1-4 are now fully in condition for allowance and a notice to that effect is respectfully requested. The PTO is hereby authorized to charge/credit any fee deficiencies or overpayments to Deposit Account No. 19-4293. If further amendments would place this application in even better condition for issue, the Examiner is invited to call applicant's undersigned attorney at the number listed below.

Respectfully submitted,

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